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there was another pause of a couple of minutes, and then with another quick bound, he seized and swallowed a third frog, equal in size to the second; this accomplished there was another pause of about five minutes, and then another quick, savage bound for a fourth victim, this time for a frog two-thirds the size of himself. Each of the three was seized and swallowed head first, but the fourth effort was not so successful as the others, for this he only managed to get into his mouth as far as its hind legs, when there was a pause and a struggle. The unfortunate frog in the mouth of the large one persisted in holding its hind legs out sidewise, at right angles to its body, as if conscious that these tactics would prevent the other from swallowing it; and at the same time the large one used its front feet, at times one, and again both, to straighten out the hind legs of his victim so that he might be able to swallow it; and while this struggle was going on, he made frequent efforts to use the sides and bottom of the cage as an object against which to press the other frog, so as to aid his efforts to swallow it. The struggle, however, after lasting a number of minutes terminated in favor of the smaller frog, for by desperate efforts it managed to elude the grasp of its assailant; but while the battle did last it used both its muscular and vocal powers to their utmost to thwart the murderous designs of its enemy.—*B. F. Koons, Mansfield, Conn., May 22d, 1883.*

ACTIVITY OF THE SENSES IN NEW-BORN INFANTS.—In a recent inaugural dissertation, Dr. Genzmer discusses the activity of the senses in new-born infants. *Inter alia*, he says the sense of touch is developed from the earliest period, and reflex actions are readily excited by the slightest stimulation of the nerves of touch, especially of the face, then of the hands, and soles of the feet. The feeling of pain is but slowly developed, and is only clearly shown after four or five weeks, before which time infants do not shed tears. Smell and taste are not distinguishable in infants. Hearing is perceptible in the first, or at most, the second day of life. New-born infants are so sensitive to light that they will turn the head to follow a mild light; while, if a strong glare be suddenly thrown on the eye, squinting is induced, and even convulsive closure of the lids. After a few days the child will follow the motion of various objects by movement of its head. Between the fourth and fifth weeks the convergence of the pupils and coordination in vision are perceptible. A distinct perception of color does not exist under four or five months; before then it is quantity rather than quality of light that is recognized.—*English Mechanic.*

#### ANTHROPOLOGY.<sup>1</sup>

THE GROWTH OF CHILDREN.—Dr. George W. Peckham, professor of biology, Milwaukee, Wis., has been making inquiries concerning the growth of children in that city. Cards similar to

<sup>1</sup> Edited by Professor OTIS T. MASON, 1305 Q street, N. W., Washington, D. C.

those used by the Massachusetts Board of Health were distributed to all the teachers, who heartily coöperated in the work. The queries included sex, age, weight, height (upright and sitting), color of eyes, hair, and skin, nationality and occupation of parentage. Writers on anthropometry have commonly studied the influence of age, sex, race, occupation, and general surroundings, without sufficient regard to the physiological laws through which they act. The size of an organism and more definitely of any group of organisms is limited, and the influence which determines the amount of food that can be assimilated under the conditions supposed is a power transmitted from parent to offspring, and known as the law of heredity. The size of an organism is the result of its inherited tendency as modified by the two varying factors of waste and repair. By far the greater portion of an individual's surroundings are determined for him by the degree of density of population in the locality in which he lives. Some excellent remarks are made on Plato's idea of archetypal forms, and the comparative value of means and averages, with a decided preference for the latter. In this the author has probably sacrificed ease to accuracy, except in very homogeneous groups. The tables in the pamphlet, showing the comparative growth of the sexes from five to twenty years, are very interesting indeed, and the addition of nationality and other factors bring out results worthy of consideration.

The reflections upon climate are quite startling. Indeed, it is deemed improbable that climate has any considerable modifying effect upon growth. This statement is subjected to a searching examination in the light of researches, such as those of Gould, Baxter, Walker and Beddoe. Walker's Atlas and Baxter's Report, studied together, give abundant proof of the non-dependence of stature on climate.

The density of population acts in two ways upon growth: It modifies, first, the hygienic conditions of the whole population, controlling the influence of occupation; second, the intensity and character of the struggle for existence.

It would seem that the superiority of stature in males over females is due to two factors: first, the arrest of growth of lower extremities in girls at about fourteen and a half years, boys experiencing no retardation in their rate of growth; second, to the falling off of the rate of growth in the bodies of girls at about the fifteenth year, and the termination of their growth at about the seventeenth year.

THE AMERICAN ANTIQUARIAN.—The second number of the current year contains the following papers:

The Hill Tribes of India. By Professor John Avery.

Indian migration as evidenced by language, II. By Horatio Hale.

Native races of Colombia, S. A., IV. By E. G. Barney.

The Somme implements and some others. By S. F. Walker.

The Potlatches of Puget Sound. By M. Eells.

Mythology of the Dakotas. By S. R. Riggs.

Village habitations. By S. D. Peet.

Specimens of the Chumeto language. By A. S. Gatschet.

Relics in Maine. By Charles B. Wilson.

The linguistic notes of the *Antiquarian*, by Mr. A. S. Gatschet, are of great value.

THE PIPE OF PEACE.—Mr. E. A. Barber has an illustrated article on the pipes of the American aborigines in *The Continent* for April 4th, which brings together much information of value. It is pleasant to read the descriptions of the old writers of the conquest. Says one: "The salvages possessed a kinde of herbe dried, which, with a cane and an earthen cup in the end, with fire and the dried herbs put together, do sucke through the cane the smoke thereof, which smoke satisfieth their hunger, and therewith they live foure or five dayes withoute meate or drinke." Another says: "This cornet of claie is a little pan, hollowed at the one side, and within whose hole there is a long quill or pipe, out of which they suck up the smoak, which is within the said pan, after they put fire to it with a coal that they lay upon it."

COMPARATIVE AND PHILOSOPHICAL RESEARCHES INTO THE CHARACTERS OF THE CRANIUM AND BRAIN.—The Bulletin of the Zoölogical Society of France for 1882 contains a treatise upon this subject by Dr. L. Manouvrier, a pupil and disciple of Broca. For fullness of detail and breadth of view, this work, which occupies 116 pages, stands far in advance of the majority of treatises upon the comparative characters of the brain. The author advocates a uniform system of craniometry, to the end that the observations taken by various craniologists may be compared with each other, and he combats the idea, held by many anthropologists, that seemingly unimportant characters, which can be described with precision, are not worthy of notice. The author differs from those who regard it as proved that the brain of the female is inferior to that of the male. The female cranium approaches in type that of a youth of the male sex, but the cranium is in relation exteriorly to the muscular system, while the brain, which influences its internal characters, is itself in relation with the motor and vegetative functions as well as with the purely intellectual ones. The relations of the brain with the intellect cannot therefore be understood unless those it has with other parts of the organism are first separated. In order to appreciate the influence of the intellectual and of the physical development on the form and quantitative development of the brain and cranium, it becomes necessary to compare individuals and groups of individuals presenting very evident difference in the development of intelligence or that of the body, such as 1st, different species of vertebrates that are nearly equal in intelligence but of different size, or vice versa; 2, individuals of the same species, but of different ages; 3, indi-

viduals of diverse races; 4, the two sexes. The conclusions Dr. Manouvrier, working be it remembered on the lines laid down by Broca, has arrived at from the last comparison, are best stated in his own words. "The strongest women, especially in the civilized races, have scarcely more muscular force than the feeblest men. The intellectual functions, on the contrary, present no appreciable difference. It is true they are applied to different objects and in consequence offer diverse sexual peculiarities, but nothing authorizes us to say that these functions are superior in intensity in either sex. \* \* \* \* \* It is true that certain writers have succeeded in making some noise these last few years by reëditing, apropos of the sexual difference of cranial capacity and weight of brain, the antique pleasantries relative to the lightness and inconstancy of women. Unfortunately for these writers, the lightness with which they have themselves passed over anatomical differences as enormous as that in muscular development of which I have just spoken, permits serious doubts as to their aptitude for psychological analysis."

The author devotes a chapter to the comparative quantitative development of the brain and of various parts of the skeleton. The femur and the mandible, according to our author, represent, by their weight, the development of those parts of the organism which influence the brain-weight, far better than do the size and weight of the body. He therefore takes, and recommends others to take, these two bones, with the addition, when possible, of the humerus, for the purpose of comparison. Unfortunately most skeletons are so mounted that the two bones first mentioned with the skull are the only pieces that can be separated.

To us it appears that the femur is about the worst bone that could be chosen for the purpose of instituting a comparison between the brain and the skeletal development of the two sexes, since its very considerably smaller size in the female gives that sex an altogether fictitious advantage.

In weight of cranium the negro races surpass any others that have been subjected to comparison, so that the proverbial thickness of a negro's skull has a foundation in fact. The skulls of Papuans and natives of New Caledonia are heavier than those of Parisians, while those of the American aborigines and of the Bengalese are lighter.

The weight of the female cranium, absolutely about one-seventh less than that of the male, is, according to the limited observations yet made, about two-ninths heavier when compared with the rest of the skeleton, showing an approach to the type of youth. In a child of six months the weight of the skull is nearly equal to that of the rest of the skeleton. The importance of the skull as a skeletal element diminishes in the following order: 1. Infant. 2. Woman. 3. Man of low stature. 4. Man of high stature. 5. Anthropoid apes. The weight of the brain in proportion to that of the body follows the same order as that of the

cranium, and is thus proportionally heavier in woman than in man, and, if allowance be made for the greater development of adipose tissue in the former, the advantage of woman in brain-weight would be still more marked. Although, on the whole, there is a parallelism between the weight of the cranium and its capacity, this relation is not absolute, and a comparison between a series of masculine and one of feminine skulls proves that the latter have greater capacity in proportion to the weight than the former. The results of an extensive series of measurements prove that the cranial capacity is greater in proportion to the weight of the skull in Parisians, Europeans generally, and Hindoos, than in negroes or other inferior races, and that in a newborn infant both cranial capacity and weight of brain, as compared with weight of skull, are three times that of the adult.

The weight of the mandible, compared with that of the skull, is greater in man than in woman, so that in this character civilized man occupies a position between civilized woman and the inferior races, but if the weight of the mandible in woman be compared with that of the femur, it is greater in woman.

The impression conveyed by a careful reading of the memoir is that the connection between brain development and intelligence is so complicated by the relations between the brain and the motor, nutritive, and, it may be added, reproductive functions, and also by those between it and the size and age of the individual, that it is impossible, with our present knowledge, to judge with any certainty of the intelligence of an individual by the weight of the brain, the capacity of the cranium or any relation of these to the entire skeleton or portions of it. Yet some of the relations established seem to point the road to further knowledge of this most abstruse of subjects.

IN MEMORIAM.—The third part of volume III, proceedings of the Davenport Academy, is devoted to the life and labors of the late J. Duncan Putnam. The engraving in front is as near perfection as a portrait can come, and will recall that pale, earnest, honest face that so many loved to look upon. The volume throughout is worthy of the subject, and of the generous spirits who assembled to pay their sincere tributes to modest worth. The closing portion of the pamphlet is devoted to a monograph of the *Solpugidæ*, to which Mr. Putnam had devoted much time. It is his work as patron, editor, and enthusiastic friend of the Davenport Academy, which will give him an enduring place in the hearts of anthropologists.

#### MICROSCOPY.<sup>1</sup>

FRENZEL'S METHOD OF FIXING SECTIONS ON THE SLIDE.<sup>2</sup>—In the October number (1882) of the *NATURALIST*, I have given the excellent method discovered by Dr. Giesbrecht of fixing sections

<sup>1</sup> Edited by Dr. C. O. WHITMAN, Newton Highlands, Mass.

<sup>2</sup> *Zoologischer Anzeiger*, No. 130, p. 51, 1883.